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**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Application Number: 09/933,364
Filing Date: August 20, 2001
Appellant(s): GAILUS ET AL.

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Motorola, Inc.
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed December 1, 2008 appealing from the Office action mailed January 2, 2008.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

Examiner has withdrawn the grounds of rejection of claims 1, 2, 4-9, 11, 13-18, 20, and 22 under 35 U.S.C 103(a) over Horowitz (US 5,722,056) in view of Kenington ('Noise Performance of a Cartesian Loop Transmitter').

The appellant's statement of the grounds of rejection of claims 1, 2, 4-9, 11, 13-18, 20, and 22 under 35 U.S.C. 102(e) over Chandler (US 6,859,097) to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

| | | |
|---|---|---|
| 6,859,097 | Chandler | 02-2005 |

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 4-9, 11, 13-18, 20, and 22 are rejected under 35 U.S.C. 102(e) as being U.S. Pat. No. 6,859,097 by Chandler.

(Note: Chandler is considered prior art based on the date of filing of the PCT (May 14, 2001) based on being filed after November 29, 2000, designating the US, and being published in English by WIPO; See MPEP 701 below: In order to rely on an international filing date for prior art purposes under 35 U.S.C. 102(e), the international application must have been filed on or after November 20, 2000, it must have been designated the U.S., and the international publication under PCT Article 21(2) by WIPO must have been in English. If any one of the conditions is not met, the international filing date is not a U.S. filing date for prior art purposes under 35 U.S.C. 102(e)).

Regarding claim 1, Chandler discloses in an electrical device (Fig. 13; i.e. circuitry)

generating a variable output signal (Y(s)), a feedback loop (i.e. elements as shown in Fig. 13 make up a feedback loop: summation of X(s), $N_1$(s), F(s); $A_1$(s); H(s); summation of $A_1$(s), H(s), $N_2$(s); $A_2$(s); output at $A_2$(s)) for adjusting the variable output signal (Y(s)), the feedback loop having an input for receiving an input signal (X(s)), an output for outputting the variable output signal (Y(s)) and a loop bandwidth (i.e. frequency of the feedback loop to ensure adequate stability) associated with a forward path (i.e. path including elements: summation of X(s), $N_1$(s), F(s); $A_1$(s); H(s); summation of $A_1$(s), H(s), $N_2$(s); $A_2$(s)) and a feedback path (i.e. path including element F(s); output at $A_2$(s)) of the feedback loop (col. 1, lines 59-67, col. 7, lines 32-54), the feedback loop comprising:

a power amplifier ($A_2$(s)) coupled to the output of the feedback loop in the forward path of the feedback loop;

at least one adjustable zero element ($H_2^{-1}$) coupled between the input of the feedback loop and the power amplifier;

at least one adjustable pole element ($H_1$, $H_2$) coupled between the input of the feedback loop and the power amplifier, wherein the at least one adjustable zero element and at least one adjustable pole element are operable to change the loop bandwidth of the feedback loop (i.e. the resonator includes pole and zero elements that change the bandwidth of the resonator and inherently change the bandwidth of the feedback loop) (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 2, the feedback loop of claim 1, wherein Chandler further discloses the at least one adjustable zero element ($H_2^{-1}$) (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 4, the feedback loop of claim 1, wherein Chandler further discloses the at least one adjustable pole element ($H_1$, $H_2$) is in the forward path of the feedback loop ($H_2^{-1}$) (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 5, the feedback loop of claim 4, wherein Chandler further discloses the at least one adjustable zero element is in the forward path of the feedback loop, the feedback loop further comprising: a mixer (i.e. summing junction; between the resonator and the power amplifier) in the forward path of the feedback loop coupled between the input of the feedback loop and the power amplifier; and a mixer (i.e. summing junction; between X(s) and F(s)) in the feedback path of the feedback loop coupled between the output of the feedback loop and the input of the feedback loop (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 6, the feedback loop of claim 5, wherein Chandler further discloses the feedback loop is used as part of a radio transmitter (col. 1, lines 4-18).

Regarding claim 7, the feedback loop of claim 1, wherein Chandler further discloses the feedback loop is a cartesian feedback loop (col. 2, lines 1-12; Fig. 13).

Regarding claim 8, the feedback loop of claim 1, wherein Chandler further discloses the adjustable pole element is a circuit comprising a plurality of elements having impedance that can be selectively coupled to other elements of the circuit (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 9, the feedback loop of claim 1, wherein Chandler further discloses the at least one adjustable pole element and the at least one adjustable zero element are substantially contained within an integrated circuit (Fig. 13; col. 7, lines 32-54).

Regarding claim 11, the feedback loop of claim 1, wherein Chandler further discloses the at least one adjustable pole element comprises two adjustable pole elements (($H_1$, $H_2$); col. 7, lines 32-54).

Regarding claim 13, Chandler discloses in a feedback loop (i.e. elements as shown in Fig. 13 make up a feedback loop: summation of X(s), $N_1$(s), F(s); $A_1$(s); H(s); summation of $A_1$(s), H(s), $N_2$(s); $A_2$(s); output at $A_2$(s)) comprising an input for receiving an input signal (X(s)), an output for outputting a variable output signal (Y(s)), a power amplifier ($A_2$(s)) coupled to the output of the feedback loop in a forward path (i.e. path including elements: summation of X(s), $N_1$(s), F(s); $A_1$(s); H(s); summation of $A_1$(s), H(s), $N_2$(s); $A_2$(s)) of the feedback loop, at least one adjustable zero element ($H_2^{-1}$) coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop (col. 1, lines 59-67, col. 7, lines 32-54), and at least one adjustable pole element ($H_1$, $H_2$) coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop (col. 1, lines 59-67, col. 7, lines 32-54), the feedback loop further having a loop and a closed loop frequency response associated with the forward path and a feedback path (i.e. path including element F(s); output at $A_2$(s)) of the feedback loop, the loop frequency response having at least one pole ($H_1$, $H_2$) and at least one zero ($H_2^{-1}$) and the closed loop frequency response being characterized by a closed loop bandwidth (col. 7, lines 32-54), a method comprising the steps of:

moving a pole ($H_1$, $H_2$) in the loop frequency response using the at least one adjustable pole element yielding a change in the closed loop frequency response (i.e. the resonator includes pole and zero elements that change the bandwidth of the resonator and inherently change the closed

loop frequency response of the feedback loop) (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 14, the method of claim 13, wherein Chandler further disclose the step of moving a pole is accomplished by switching among a plurality of elements having different impedances (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 15, the method of claim 13, wherein Chandler further disclose the step of: moving a zero in the loop frequency response using the at least one adjustable zero element yielding a change in the closed loop frequency response (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 16, the method of claim 15, wherein Chandler further disclose the step of moving a zero is accomplished by adjusting an amplifier with an adjustable gain (col. 1, lines 41-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 17, the method of claim 13, wherein Chandler further discloses the power amplifier amplifies the input signal so that it can be transmitted over a radio channel (col. 1, lines 4-18 and lines 59-67; col. 7, lines 32-54).

Regarding claim 18, Chandler further discloses an integrated circuit implementing substantially all the components of a feedback loop with adjustable frequency response, the integrated circuit the feedback loop of claim 1 (Fig. 13; col. 7, lines 32-54).

Regarding claim 20, Chandler discloses in a feedback loop (i.e. elements as shown in Fig. 13 make up a feedback loop: summation of X(s), $N_1$(s), F(s); $A_1$(s); H(s); summation of $A_1$(s), H(s), $N_2$(s); output at $A_2$(s)) having an input for receiving an input signal (X(s)), an output for outputting a variable output signal (Y(s)) and a loop bandwidth (i.e. frequency of the feedback

loop to ensure adequate stability) associated with a forward path (i.e. path including elements: summation of X(s), $N_1$(s), F(s); $A_1$(s); H(s); summation of $A_1$(s), H(s), $N_2$(s); $A_2$(s)) and a feedback path (i.e. path including element F(s); output at $A_2$(s)) of the feedback loop (col. 7, lines 32-54), the feedback loop comprising:

a power amplifier ($A_2$(s)) coupled to the output of the feedback loop in a forward path (i.e. path including elements: summation of X(s), $N_1$(s), F(s); $A_1$(s); H(s); summation of $A_1$(s), H(s), $N_2$(s); $A_2$(s)) of the feedback loop;

at least one adjustable zero element ($H_2^{-1}$) coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop (Fig. 13) (col. 1, lines 59-67);

at least one adjustable pole element ($H_1$, $H_2$) coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop (Fig. 13) (col. 1, lines 59-67);

a first mixer (i.e. summing junction; between the resonator and the power amplifier) in the forward path of the feedback loop coupled between the input of the feedback loop and the power amplifier;

and a second mixer (i.e. summing junction; between X(s) and F(s)) in the feedback path of the feedback loop coupled between the output of the feedback loop and the input of the feedback loop, wherein the at least one adjustable zero element ($H_2^{-1}$) and at least one adjustable pole element ($H_1$, $H_2$) are operable to change the loop bandwidth of the feedback loop (i.e. the resonator includes pole and zero elements that change the bandwidth of the resonator and inherently change the bandwidth of the feedback loop) (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

Regarding claim 22, Chandler discloses in a feedback loop (i.e. elements as shown in Fig. 13 make up a feedback loop: summation of X(s), $N_1$(s), F(s); $A_1$(s); H(s); summation of $A_1$(s), H(s), $N_2$(s); output at $A_2$(s)) comprising an

input for receiving an input signal (X(s)), an output for outputting a variable output signal (Y(s)), a power amplifier ($A_2$(s)) coupled to the output of the feedback loop in a forward path (i.e. path including elements: summation of X(s), $N_1$(s), F(s); $A_1$(s); H(s); summation of $A_1$(s), H(s), $N_2$(s); output at $A_2$(s)) of the feedback loop, at least one adjustable zero element ($H_2^{-1}$) coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop, and at least one adjustable pole element ($H_1$, $H_2$) coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop (col. 1, lines 59-67; col. 7, lines 32-54), the feedback loop further having a loop and a closed loop frequency response associated with the forward path and a feedback path of the feedback loop, the loop frequency response having at least one pole ($H_1$, $H_2$) and at least one zero ($H_2^{-1}$) and the closed loop frequency response being characterized by a closed loop bandwidth (col. 7, lines 32-54), a method comprising the steps of:

moving a pole ($H_1$, $H_2$) in the loop frequency response using the at least one adjustable pole element yielding a change in the closed loop frequency response; and moving a zero ($H_2^{-1}$) in the loop frequency response using the at least one adjustable zero element yielding a change in the closed loop frequency response (i.e. the resonator includes pole and zero elements that change the bandwidth of the resonator and inherently change the closed loop frequency response of the feedback loop) (col. 1, lines 59-67; col. 2, lines 13-19; col. 7, lines 32-54).

**(10) Response to Argument**

**Claims 1, 2, 4-9, 11, 13-18, 20, and 22**

Appellant's arguments are fully considered but they are not persuasive. Regarding independent claims 1, 13, 20, and 22, Appellant argues that Chandler does not disclose: (1) at least one adjustable zero element (coupled) between the input of the feedback loop and the power amplifier (in the forward path of the feedback loop). However, the examiner respectfully disagrees.

Chandler discloses in the circuitry of Fig. 13 the elements of a feedback loop (i.e. elements as shown in Fig. 13 make up a feedback loop: summation of X(s), N1(s), F(s); A1(s); H(s); summation of A1(s), H(s), N2(s); A2(s); output at A2(s)). Element H(s) is a resonator including any bandpass filter arrangement having pole ($H_1$, $H_2$) and zero ($H_2^{-1}$) elements as discussed in col. 1, lines 59-67 and col. 7, lines 32-54. Further, Chandler discloses 'at least one adjustable zero element [Fig. 13: Resonator H(s) including poles ($H_1$, $H_2$)] (coupled) between the input [Fig. 13: X(s)] of the feedback loop and the power amplifier [Fig. 13: A2(s)] (in the forward path [i.e. path including elements: summation of X(s), $N_1$(s), F(s); $A_1$(s); H(s); summation of $A_1$(s), H(s), $N_2$(s); output at $A_2$(s)] of the feedback loop)'. Thus, Chandler reads on the claimed limitation 'at least one adjustable zero element (coupled) between the input of the feedback loop and the power amplifier (in the forward path of the feedback loop)'.

Further, Appellant argues that the poles and zeros in Fig. 13 of Chandler are in the feedback loop and not the forward path as evidenced by claim 10 in Chandler in col. 9, lines 35-47. However, this claim 10 is in reference to Fig 1 and Fig 5 in Chandler and not Fig. 13. Further, Applicant argues that Chandler does not claim the limitation because of this statement in

col. 7, lines 48-49: '…it may be desirable to implement a zero in the feedback path to improve dynamic performance and stability…'. However, this disclosure is not in support of Fig. 13 which shows Resonator H(s) including a pole ($H_2^{-1}$) in the forward path of the feedback loop.

Claims 2, 4-9, 11, and 18 depend on claim 1, and are therefore rejected for the same reasons set for claim 1.

Claims 14-17 depend on claim 13, and are therefore rejected for the same reasons set for claim 13.

**Claim 7**

Regarding claim 7, Appellant argues that Chandler does not disclose: (1) the feedback loop is a 'Cartesian feedback loop'. However, the examiner respectfully disagrees.

Applicant incorrectly noted claim 6 on page 17 of the brief as being the claim in disagreement but it is pending claim 7. Fig. 13 in Chandler discloses a bandpass feedback including a resonator H(s) (col. 1, lines 59-67; col. 7, lines 32-47). Further, Chandler states that bandpass feedback, like Cartesian feedback, is only concerned with complex input signals in col. 2, lines 9-12. Thus, Examiner concludes that Fig. 13 is a bandpass feedback but has characteristics of a Cartesian feedback as noted in the above citation and claim 7 is rejected.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Lisa Hashem/

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